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SOVIET SCIENTISTS PROBABLY PREPARING
FOR LARGE LUNAR SOFT LANDING VEHICLE

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Soviet scientists are preparing experiments for what is probably a large lunar soft landing vehicle. B. G. Yegiazarov and G. Y. Kiryanov, two leading Soviet scientists in the field of activation analysis development, recently told a U.S. scientist that they had developed a lunar surface composition sensor that would be part of a soft landing payload. Their remarks suggest that the soft lander is probably a larger successor to soft landers of the Lunik 5 class. The device, built to analyze the chemical composition of the lunar surface, consists of a neutron generator to bombard samples of the lunar surface, a scintillation crystal to observe the induced gamma radioactivity of the sample, electronics to determine the energy distribution of the radiation, and a digital computer to determine the percentage of major chemical constituents of each sample. The experiment is similar to the activation analysis experiment designed for the U.S. Surveyor vehicle. The Soviets said that it was not as light as the U.S. instrument but did not need to be, because of the greater booster capability of the USSR. When asked when their instrument would go to the moon, the Soviets stated "soon" but not as soon as they would like.

Soviet unmanned lunar research plans must be broad in scope to include a com-

plex basic science experiment in the near future. An activation analysis experiment only determines the chemical composition of the lunar soil. The Soviets must have higher priority experiments to determine the bearing strength and other mechanical properties of the lunar surface. To carry out both basic and applied lunar research in the next few years the Soviets will need either a large soft lander or many smaller ones.

The Soviet activation analysis experiment seems to be planned for a large soft landing vehicle which may be flown one or two years from now. Lunik 5, which the Soviets claimed was launched to "test elements of soft landing apparatus" probably could not carry the experiment. The weight of the activation analysis gear seems to preclude its presence in the payload of a Lunik 5 class soft lander. The Soviet instrument is believed to be substantially heavier than the U.S. instrument (which weighs more than 50 pounds), perhaps 100 to 150 pounds. It has been estimated that Lunik 5 could soft land an instrument compartment of 700 to 800 pounds. The weight would have to include structure, power supply, computer-programmer, telemetry equipment, transmitters, and possibly earth-seeker and high-gain antenna in addition to 300 or less pounds of instruments.

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Three-hundred pounds would not permit the activation analysis experiment to be accompanied by vital soil mechanics and video experiments. Also, the statement that it would not be flown as soon as the scientists would like is not consistent with its being on Lunik 5 or any of the failures which preceded it.

The Soviets can reasonably be given a

technical capability for a large soft lander in the not-too-distant future. It is anticipated that they will soon begin to test a space booster much larger than the SS-6. Just as the SS-6 Lunik combination was tested launching the early Luniks, the Soviets might find it profitable to test their new booster and conduct their lunar soft lander program at the same time.
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